Tariff Calculation Of The Model PPA For LNG And Coal Fired Power Project Under Circular 57/2020

1. Background


1.2. In this post, we will provide our summaries and comments on the tariff calculation of the model power purchase agreement under Circular 57/2020 (Model PPA) between an independent power producer (IPP) as the seller, and Vietnam Electricity Corporation (EVN) as the buyer.

2. Comments on tariff calculation and output provisions of the Model PPA

No “take-or-pay” and “take-and-pay” PPA\(^2\)

2.1. Subject to the discussion at 2.2, the Model PPA is strictly not a “take-or-pay” or “take-and-pay” PPA because:

2.1.1. to generate electricity, the IPP must follow dispatch orders from the market and network operator (see 3.4.3);

2.1.2. EVN has no obligations to purchase any minimum amount of electricity from the IPP. And there is no deemed delivered output; and

2.1.3. there is no “capacity charge” payable to the IPP with no dispatch of electricity required. All electricity payment to the IPP is calculated based on the actual or contracted output of the power plant (see 3.4 to 3.5).

Limited offtake security

2.2. When the IPP participates in the “competitive electricity market”\(^3\) (National Market), a part of the payable output to the IPP under the Model PPA will be linked to a fixed annual output of certain million MWh.\(^4\) However, the authority still has the discretion to adjust the payable output and the IPP must

\(^1\) Circular 56 of the Ministry of Industry and Trade dated 19 December 2014 on methods to determine electricity price and review of power purchase agreement, as amended (Circular 56/2014).

\(^2\) We use the concepts of “take-or-pay”, and “take-any-pay” as per the explanation at [http://tinyurl.com/y4z265v3](http://tinyurl.com/y4z265v3).

\(^3\) Thị trường điện cạnh tranh.

\(^4\) Item II Schedule 5 of the PPA.
maintain its status as a member of the National Market (see 3.5 to 3.6).

**Cap on inflation pass through**

2.3. While a change in inflation (which is calculated using CPI) is reflected in the calculation of electricity price, the change is capped at 2.5% per year. This number is lower than the normal annual inflation rate in Vietnam.

**No foreign exchange risk pass through**

2.4. Change in the foreign exchange rate is not reflected in the calculation of electricity price. The Model PPA has a mechanics where the IPP may report the impact of the exchange rate movement on its operation for the MOIT’s consideration. However, there is no obligation on the part of the MOIT to change the electricity price to reflect such impact.

**Changes compared to Circular 56/2014**

2.5. Compare to Circular 56/2014, Circular 57/2020 does not have changes relating to the matters discussed in Sections 2.1 to 2.4 above. In general, the tariff calculation in Circular 57/2020 does not have major changes.

3. **Summary of tariff and output provisions of the Model PPA**

**Two pricing phases**

3.1. In terms of payment calculation, the Model PPA is divided into two phases:

3.1.1. **Phase 1**, when the power plant does not participate in the National Market; and

3.1.2. **Phase 2**, when the power plant participates in the National Market.

**Unit price calculation**

3.2. The unit price (VND/kWh) to determine the amount payable under the Model PPA is calculated based on the following formula:

\[
\text{Unit Price} = \text{Fixed Capacity Price} + \text{O&M Price} + \text{Variable Price}
\]

Of which:

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5 Article 14.1(b), 15.2(b) of Circular 57/2020 and Item VII of Schedule 1 of Circular 57/2020.
6 Item III.2.6 Schedule 5 of the PPA.
7 Item III.2 of Schedule 5 of the PPA.
8 Item I.1 Schedule 5 of the PPA.
3.2.1. **Fixed Capacity Price** is a fixed number for each contract year. Fixed Capacity Price can be:

(a) the same fixed average price for all contract years; or

(b) different fixed prices for each specific contract year during the PPA term as long as the annual average price of the whole PPA term is equal to the fixed average price.

According to Circular 57/2020, the Fixed Capacity Price is intended to cover the capital costs of the investor with a rate of return not exceeding 12% p.a.\(^9\)

3.2.2. **O&M Price** is the aggregate of:\(^{11}\)

(a) price for major repair, equipment and service costs;\(^{11}\) and

(b) price for employment costs.\(^{13}\)

The O&M Price is determined annually based on the base rate (a fixed rate determined at the base year of the power plant) and the relevant inflation rate. The inflation rate does not exceed 2.5% per year.

3.2.3. **Variable Price** is the aggregate of:\(^{14}\)

(a) primary fuel price component;

(b) secondary fuel (oil) price component;

(c) other fluctuation price component; and

(d) primary fuel transport price component.

3.2.4. Each component of Variable Price is calculated as follows:

(a) **primary fuel price** component is equal to:\(^{15}\)

\[
[\text{Base Average Heat Rate}] \times [\text{Heat Rate Adjustment Coefficient}] \times [\text{Primary Fuel Price}] \times [\text{Heat Rate Loss Adjustment Coefficient}]
\]

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\(^{10}\) Article 3.1(b) and 5 of Circular 57/2020. The generating price of the power plant is determined based on the principle that the internal rate of return does not exceed 12%. The input used to determine the Fixed Capacity Price includes, among other things, total investment capital of the project, power plant’s expected lifetime, potential energy output each year, and interest payment costs.

\(^{11}\) Item I.1.2 of Schedule 5 of the PPA. Article 6 of Circular 57/2020.

\(^{12}\) This is “FOMC\(^{\text{c}}\)” in the formula provided at item I.1.2 Schedule 5 of the PPA.

\(^{13}\) This is “FOMC\(^{\text{n}}\)” in the formula provided at item I.1.2 Schedule 5 of the PPA.

\(^{14}\) Item I.1.3 Schedule 5 of the PPA. Article 7 of Circular 57/2020.

\(^{15}\) Item I.1.3(a) Schedule 5 of the PPA.
In which:

(i) **Base Average Heat Rate**: the fixed average heat rate determined at the base year (kcal/kWh or kJ/kWh or BTW/kWh). Base Average Heat Rate is agreed by the relevant IPP and EVN but must not higher than (i) the basic design/technical design equivalent to the total investment cost used to calculate the tariff, or (ii) specifications of the manufacturer, calculated with the load of 85%;\(^{16}\)

(ii) **Heat Rate Adjustment Coefficient**: the coefficient to adjust the heat rate to the actual operating conditions following the temperature of cooling water and environment temperature. Such coefficient is agreed by IPP and EVN;

(iii) **Primary fuel Price**: the primary fuel price calculated by the weighted average under the actual volume of fuel purchase contracts in the relevant months; and

(iv) **Heat Rate Loss Adjustment Coefficient**: the coefficient reflects performance degradation of the power plant through the years. The coefficient is calculated under the following formula: \[1 + (\text{numerical order of the current contract year} – 1) \times \text{Heat rate loss percentage}\]. Schedule 1 of Circular 57/2020 regulates that the average heat rate loss percentage during the economic lifetime of the combined cycle gas turbine plant is 3%.

(b) **Secondary fuel (oil) price** component is equal to:\(^{17}\)

\[\text{[Base Oil Price Component]} \times [\text{Heat Rate Loss Adjustment Coefficient}] \times [\text{contract year oil price/base oil price}]\]

In which:

(i) **Base Oil Price Component**: the fixed oil price component determined at the base year. Base Oil Price Component is the product of (i) the average heat rate of oil, and (ii) oil price (inclusive of transport fee) at the base year.

(c) **other fluctuation price component** is equal to:\(^{18}\)

\[\text{[Base Other Fluctuation Price Component]} \times [\text{Heat Rate Loss Adjustment Coefficient}]\]

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\(^{16}\) Article 7.1 and Item VIII of Schedule 1 of Circular 57/2020.

\(^{17}\) Item I.1.3(b) Schedule 5 of the PPA.

\(^{18}\) Item I.1.3(c) Schedule 5 of the PPA.
[Inflation Coefficient]

In which:

(i) **Base Other Fluctuation Price Component**: the fixed component determined at the base year reflecting the cost of auxiliary material, starting cost, and annual maintenance cost.

(ii) **Inflation Coefficient**: the coefficient reflects the inflation through the years. Such coefficient is calculated under the following formula: \[(1 + \text{inflation rate for other fluctuation})^{\text{contract year} - 1}\]

(d) **Primary fuel transport price** component is equal to:\(^{(19)}\)

\[
[\text{Base Average Heat Rate}] \times [\text{Heat Rate Adjustment Coefficient}] \times [\text{Main Transport Price}] \times [\text{Heat Rate Loss Adjustment Coefficient}]
\]

In which:

(i) **Main Transport Price**: the fixed transport price determined at the base year. The Main Transport Price for LNG power plant is the weighted average price under LNG transport contracts and contracts for storage, regasification, and distribution of LNG.\(^{(20)}\)

(ii) The adjustment to the primary fuel transport price component is similar to the adjustment to primary fuel price component. If the primary fuel price is inclusive of transport price, the primary fuel transport price component is set at 0.

**Specific connection price**

3.3. Over the Unit Price, the specific connection price\(^{(21)}\) will be topped up. The total of Unit Price and specific connection price is called the generating price of a power plant.\(^{(22)}\) The specific connection price is new component introduced by Circular 57/2020. The specific connection price is for the IPP to recover the specific connection cost of the IPP to build the transmission line and substation from the distribution yard of the power plant to the connection point as (i) agreed with EVN, or (ii) assigned by the competent authority.\(^{(23)}\) The specific connection price is calculated in VND/kWh, VND/kW, or VND/month\(^{(24)}\) and based on specific connection cost, investment cost structure, borrowing interest rate,

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\(^{(19)}\) Item 1.3(d) Schedule 5 of the PPA.

\(^{(20)}\) Article 7.4 of Circular 57/2020.

\(^{(21)}\) Giá dịch vụ kỹ thuật.

\(^{(22)}\) Article 3.2 of Circular 57/2020.

\(^{(23)}\) Article 2.5 of Circular 57/2020.

\(^{(24)}\) Article 8.1 of Circular 57/2020.
management cost, O&M cost, and other factors to ensure the IPP to recover the cost to build, manage, operate, maintain the built transmission line and substation under the law.

Phase 1 – Payment calculation

3.4. Under the Model PPA, during Phase 1, EVN will pay the IPP a monthly payment according to the following formula:

\[ \text{Monthly Payment} = \text{Unit Price} \times \text{Monthly Output} + \text{Specific Connection Payment} \]

Of which:

3.4.1. the Unit Price is determined in accordance with the formula described at 3.2;

3.4.2. the Specific Connection Payment is determined based on the specific connection fee described at 3.3; and

3.4.3. the Monthly Output is the actual power output delivered by the IPP to EVN during the relevant month according to the Model PPA. Under the Model PPA, the IPP will need to operate in accordance with regulations on dispatch, electricity transmission system, and National Market. Accordingly, the IPP can only deliver its electricity to EVN according to dispatch orders of the market and network operator.

Phase 2 – Payment calculation

3.5. Under the Model PPA, during Phase 2, EVN will pay the IPP a monthly payment equal to the aggregate of:

3.5.1. Total payment payable to the IPP by EVN calculated by the market and network operator. This payment is determined in accordance with the regulations of the National Market;

\[ \text{Total Payment} = \text{Market Payment} + \text{Network Payment} \]

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25 Item III.2.1 Schedule 5 of the PPA.
26 For simplicity, we exclude VAT and other tax payment from the fomula.
27 Articles 7.1 and 7.2 of the PPA.
28 Article 4.3, 7 and 49 of Circular 40 of MOIT dated 5 November 2014 on the procedure for dispatching of the national electricity system (Circular 40/2014).
29 Item III.2.2 Schedule 5 of the PPA.
30 Item III.2.2.5 Schedule 5 of the PPA.
31 Item III.2.2.5 Schedule 5 of the PPA.
3.5.2. Payment for difference for each trading cycle, which is equal to:

\[ \text{Contract Unit Price} - \text{Market Price} \times \text{Contract Output} \] (see Note at 3.6)

3.5.3. Specific Connection Payment;

3.5.4. Other payments due under the Model PPA or the regulations of the National Market.

3.6. **Note**: The Contract Output for each trading cycle is the planned output for such trading cycle calculated according to Circular 45/2018 and based on the annual Contract Output calculated according to Item II Schedule 5 of the Model PPA. In particular, the annual Contract Output is equal to:

\[ \alpha \times \text{AGO} \]

of which:

3.6.1. \( \alpha \) is a percentage agreed by the IPP and EVN in the range of 60% to 100%, and

3.6.2. AGO is the planned annual output of the power plant but must be in the range of (a)times Average Annual Output to (b)times Average Annual Output (such range, Contract Output Range). The Average Annual Output is set out in Item II.1 of Schedule 5 of the Model PPA. Coefficients (a) and (b) are published by the MOIT unless the PPA stipulates otherwise.

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33 Each trading cycle (chu kỳ giao dịch) in the competitive National Market is 60 minutes (Article 12 of Circular 45/2018, Item III.2.2.1 of Schedule 5 of the PPA).
34 For simplicity, we have simplified the formula in the PPA (Item III.2.2.1 of Schedule 5 of the Model PPA).
35 This is the Unit Price calculated in accordance with the formula at 3.2.
36 This is the electricity price payable to the IPP in the National Market.
38 Article 27.1(c) of Circular 45/2018.
39 Articles 16.1(a) and 16.1(b) of Circular 45/2018.
40 “Average Annual Output” is referred to as “GO” in the formula provided in Article 27.1 of Circular 45/2018.
41 Article 27.1 of Circular 45/2018.